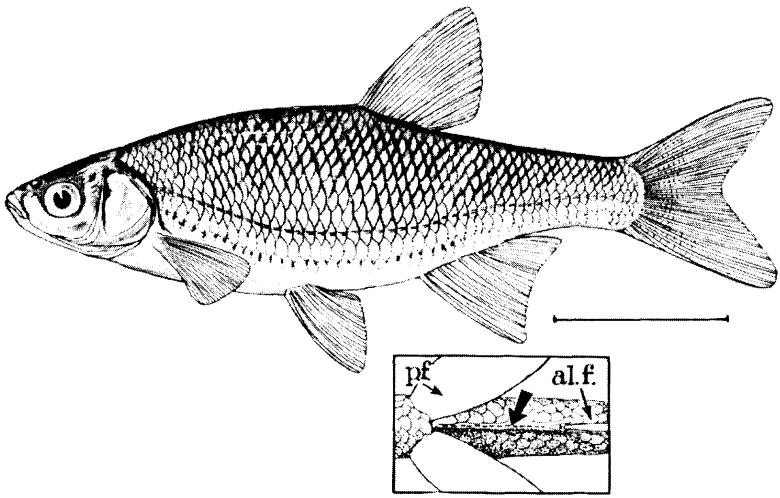
GOLDEN SHINER
Notemigonus crysoleucas

Notemigonus = black half-angle
crysoleucas = gold-white



DISTINGUISHING CHARACTERISTICS

A small, flat-bodied minnow with greenish back, it has golden or silvery sides, and brass-colored belly. The fins are yellowish, or red in the breeding season. The scales are large. This species has a scaleless ridge or keel that extends from the pelvic to anal fins. The anal fin is sickle-shaped. The lateral line is strongly decurved. Teeth are 5-5, hooked, with a grinding surface.

DISTRIBUTION IN CALIFORNIA

The golden shiner was first imported from the eastern United States into San Diego County in 1891. It has become an important bait minnow in northern California since 1950, and is now established widely in the Sacramento-San Joaquin river system.

GENERAL INFORMATION

Golden shiners spawn in the spring and early summer. The adhesive eggs stick to vegetation or other objects. This species thrives in waters with heavy growths of aquatic vegetation.

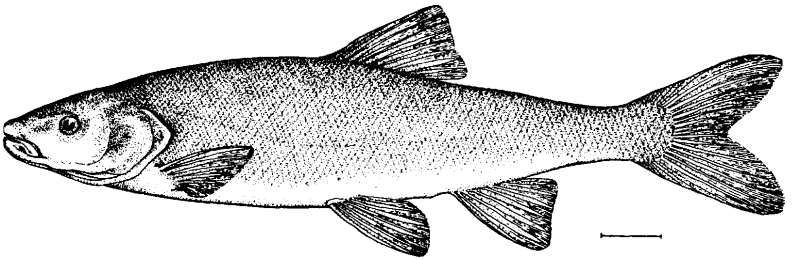
It is said to destroy mosquito larvae in lakes efficiently.

IMPORTANCE

Golden shiners are raised in large numbers by commercial bait dealers and are utilized as forage by warmwater game species in waters in which they are present. They may have a detrimental effect on trout in cooler waters.

SACRAMENTO BLACKFISH
Orthodon microlepidotus

Orthodon = straight tooth
microlepidotus = small-scaled



DISTINGUISHING CHARACTERISTICS

The blackfish is a large, dark minnow with an upturned mouth. It is nearly round in cross section and has a conically-shaped head. It has small, fine scales. In Clear Lake, Lake County, it grows to a length of two feet. The pharyngeal teeth are 5-6 or 6-6, very long, and nearly straight.

DISTRIBUTION IN CALIFORNIA

It is found in the large natural lakes of central California, such as Clear Lake, and the lower slough-like reaches of the Sacramento and San Joaquin rivers and their associated drainages. It does not move into the swifter portions of the tributaries or into the foothill reaches of the rivers.

The blackfish reached its greatest abundance in the marshy, overflow areas, like Tulare Lake. It has been introduced into southern California.

GENERAL INFORMATION

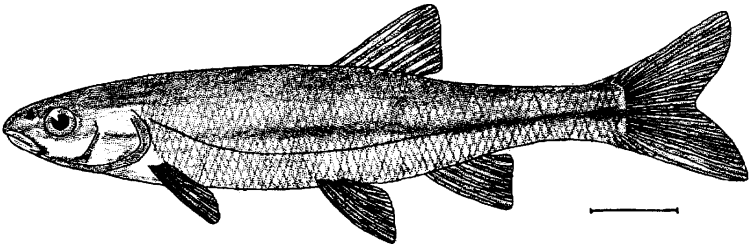
Like the carp, it spawns in shallows and is a prolific egg producer. A 17-inch female contained an estimated 350,000 eggs. The growth rate is rapid. In Clear Lake, blackfish range from 2.5 to 6.5 inches in length at the end of their first growing season. It feeds on plankton and bottom materials.

IMPORTANCE

The blackfish is of minor commercial importance, with over 100,000 pounds harvested in 1962: Fish are trucked alive to fish markets in Oriental districts, where the buyers select fish and carry them home alive. The young of this species are eaten by game fishes.

HARDHEAD
Mylopharodon conocephalus

Mylopharodon = throat tooth grinder
conocephalus = cone head



DISTINGUISHING CHARACTERISTICS

This large native minnow attains a length of about two feet. It is slender, the body cross section is round, and it has a large mouth in a conical, somewhat flattened head. A piece of skin, called a frenum, joining the center of the upper lip to the head, distinguishes it from the squawfish, which it otherwise resembles. The color is a bronze green above, shading to cream on the belly. The pharyngeal teeth are 2, 5-4, 2. Two or three of the teeth in the main row are molar-like, bluntly rounded, and much enlarged.

DISTRIBUTION IN CALIFORNIA

It is found generally throughout the rivers of the Sacramento-San Joaquin drainage and in several isolated basins, such as the Russian River.

GENERAL INFORMATION

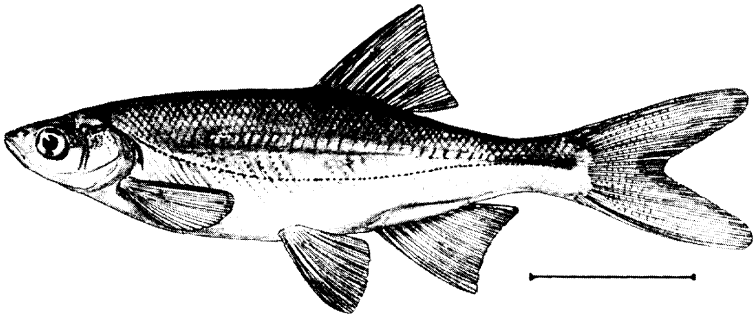
The hardhead is omnivorous, feeding upon insects when young and on small fish and aquatic plants when adult. The clearer foothill streams form its favored habitat. It spawns in the spring, although the spawning habits are not known. It is commonly associated with the Sacramento squawfish.

IMPORTANCE

When young, it is eaten by game fish. A few fish are taken each year by commercial fishermen.

HITCH
Lavinia exilicauda

Lavinia = a classical feminine name
exilicauda = slender toil



DISTINGUISHING CHARACTERISTICS

This native minnow has a deep, compressed body with a slender caudal peduncle. The head is small and conical, with a small mouth. The scales are large. The anal fin is longer and higher than in most native minnows. Males are smaller than females, and darker in coloration. The pharyngeal teeth are 4-5 or 5-5, long and compressed, with hooked tips and narrow, well-developed grinding surfaces.

DISTRIBUTION IN CALIFORNIA

Two subspecies of hitch are found in California:

The Sacramento hitch, *Lavinia exilicauda exilicauda*, is found throughout the lowland streams and lakes of the Central Valley, in Clear Lake, and in the Russian River.

The Monterey hitch, *Lavinia exilicauda harengus (harengus* = herring), inhabits streams tributary to Monterey Bay.

GENERAL INFORMATION

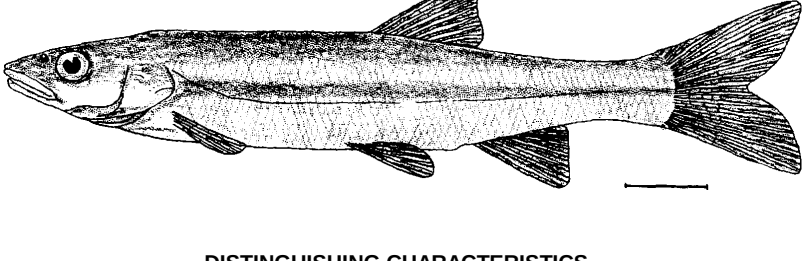
The hitch spawns mainly in streams, running up small creeks during early spring rains. In Clear Lake, this species has been observed spawning on gravelly shores. The hitch is prolific. A 10-inch female had 112,000 eggs. Young hitch feed on small animal plankton and insects along the shore. Adults eat plankton in the open waters. It lives in lowland streams, sloughs, and lakes, usually avoiding swift waters. Hitch grow rapidly, averaging about 5.5 inches long at the end of the first year's growth.

IMPORTANCE

The hitch was an important bait minnow before regulations against the capture, sale, and use of wild minnows were adopted. It has been the object of a number of expensive eradication programs where it interfered with sport fisheries. The young provide forage for warmwater game fish.

SACRAMENTO SQUAWFISH
Ptychocheilus grandis

Ptychocheilus = folded lip
grandis = large



DISTINGUISHING CHARACTERISTICS

The squawfish is a slender minnow, somewhat pike-like in appearance but with a toothless mouth. It may attain a length of three feet or more. The color is olive or brownish green above to silvery on the belly. There are usually a few silvery or reflecting scales in the darker portion that flash in the sunlight as the fish swims. The fins are often reddish-orange. The throat teeth are 2, 5-4, 2, long and sharp.

DISTRIBUTION IN CALIFORNIA

It is present in the streams and lakes throughout the Central Valley, the Russian River, and the streams tributary to Monterey Bay.

GENERAL INFORMATION

The squawfish is extremely predatory as it becomes larger. The smaller fish eat mainly insects. This species usually spawns in streams, although one population in a Modoc County reservoir spawns successfully on the shore. The Sacramento squawfish prefers the less turbid rivers and streams. Heavy silt pollution for long periods will cause them to disappear. They range well up into many foothill streams, where they are commonly associated with smallmouth bass. The most common native associate is the hardhead.

IMPORTANCE

It is an important predator on small steelhead in the Russian River. Elsewhere, it preys heavily on resident trout. It takes artificial lures readily and the larger individuals offer some sport, although their stamina is short-lived.

RELATED SPECIES

The Colorado River squawfish, *Ptychocheilus lucius (lucius* = pike), resembles the Sacramento species, but has a more flattened profile, larger

mouth, and relatively smaller eyes. It reputedly reaches a length of five feet and a weight of 80 pounds. It is restricted to the Colorado River and its tributaries.

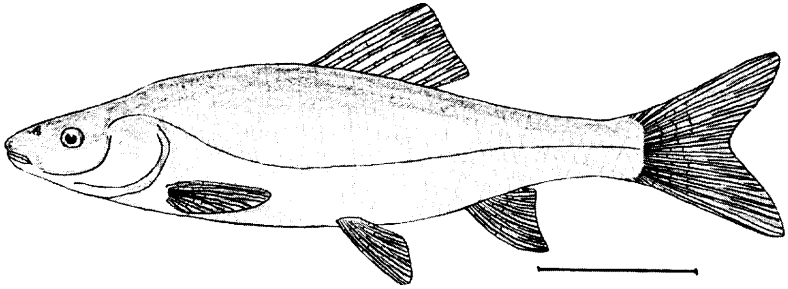
It was once an important food fish of the Indians, and later the white settlers. It was called “white salmon” by the early settlers because of its great size and periodic upstream migrations.

Construction of dams on the Colorado River has blocked regular migrations, severely reducing its numbers. It is of no sport or economic importance now, but is a unique and interesting species.

ARROYO CHUB

Gila orcuttii

Gila = Gila River
orcuttii = Charles Russell Orcutt, botanist who collected it.



DISTINGUISHING CHARACTERISTICS

This is a small, heavy bodied minnow, grey-green to olive green on the back, shading to nearly white on the belly. The throat teeth are in two rows, and can be 2, 4-4, 2, 2, 5-4, 2, 2, 4-4, 1, or 2, 5-4, 1. They are closely set, narrow, hooked, and without grinding surfaces.

DISTRIBUTION IN CALIFORNIA

It is found in the coastal streams of southern California. Its range has been restricted by water developments and extended, in some instances, by unauthorized introductions. It has been introduced into the Mojave River, where it hybridized readily with a related species, the Mojave chub.

GENERAL INFORMATION

The chub spawns in the spring in either streams or lakes. It feeds on insects and, in lakes, also on plankton. It grows only to 4 or 5 inches in small streams, but to 10 or 12 inches in lakes.

IMPORTANCE

It is of limited value as forage for predator sport fish, such as largemouth bass. It competes with trout for food and space in some southern California waters.

RELATED SPECIES

A similar minnow, growing to a larger size than the Arroyo chub, is the Klamath chub, *Gila bicolor (bicolor* = two-colored), of the Klamath River drainage. Its habits resemble those of the southern species.

The thicktail chub, *Gila crassicauda (crassicauda* = fat-tail), is found in the lower reaches of the Sacramento-San Joaquin rivers. It is extremely

rare and little in known of its habits. It grows to a length of at least 12 inches.

The Colorado River bonytail chub, *Gila robusta elegans (robusta* = stout, *elegans* = elegant), is restricted to the Colorado River. It is unusual in appearance, with a very long, slender tail section, an elevated dorsal profile with a pronounced hump, and a somewhat flattened snout with a small mouth. The fins are long and sickle-shaped, and the eyes are small and placed low on the head. It is now extremely rare in California.